

# LITHOLOGIC LOG

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## LOCATION MAP:



ST-1-630 • ST-1-541  
ST-1-473 to ST-3  
and  
ST-4 pads

NASA Well Road

\*not to scale

SW 1/4 SW 1/4 NW 1/4 SE 1/4 S32 T20S R3E

SITE ID: NASA-WSTF LOCATION ID: ST-1-630

SITE COORDINATES (ft.):

N 229179.820 E 401046.481

GROUND ELEVATION (ft. MSL): 4501.61

STATE: NEW MEXICO COUNTY: DOÑA ANA

DRILLING METHOD: Mud Rotary/Air Foam Rotary

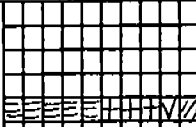





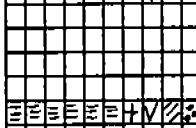

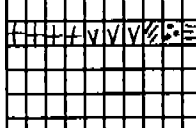
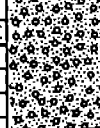

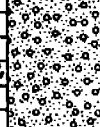





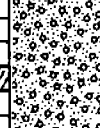


DRILLING CONTR.: Larjon Drilling Co





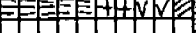

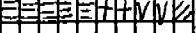









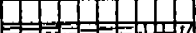

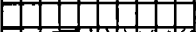



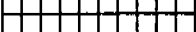

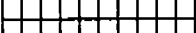

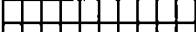

DATE STARTED: 06/16/92 DATE COMPLETED: 07/21/92

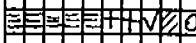
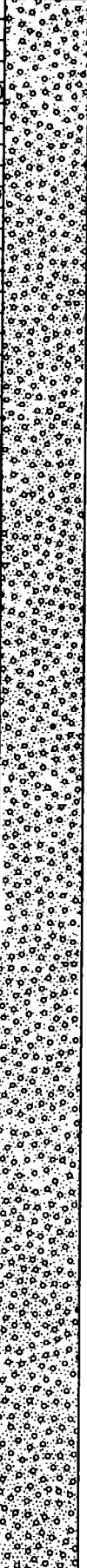
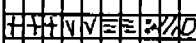
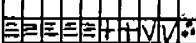







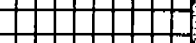
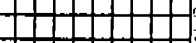
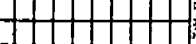

FIELD REP.: M. Canavan, D. Menzie

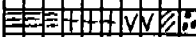

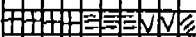
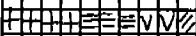





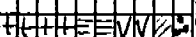

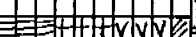
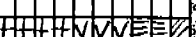
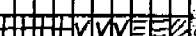

COMMENTS: Drilled mud rotary 12 1/2" pilot hole 0'-85'. Reamed to 16" and installed 85' of 10" surface casing. Drilled air foam rotary 9 7/8" borehole 85'-698'. Bedrock (Tuff) encountered at 645. TD = 698'.

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
5	=====		Timed by driller  18	Cuttings (grab sample every 5')	<p><u>Alluvium (Santa Fe Group):</u> Multicolored formation clasts and cuttings comprise the alluvium at ST-1-630. Grains range from clay-size to cobble size and samples may be well-to poorly-sorted. Unit is an unconsolidated to semiconsolidated polygenetic pebble to boulder conglomerate. Clays comprise from 20%-80% of most samples from 0'-380' and these percentages are probably enhanced by the bentonite-mud drilling fluid. Lithology of clasts is highly variable. Limestone dominates samples from 0'-290' and is light gray (N8) to grayish black (N1) with no recognizable allochems. Other sedimentary rocks include greenish gray (5 GY 6/1) and dusky red (5 R 3/4) laminated to nonlaminated siltstone and light brown to yellow brown fine-grained sandstone. Caliche is present as cementing agent and grain coatings in upper 20' of unit. Volcanic clasts include various rhyolites, tuffs and andesites. Other miscellaneous rock types include quartzite, granite, chert and quartz and feldspar grains.</p> <p>0'-25' Cuttings range in size from &lt; 0.1 inches to 0.3 inches. Average size is 0.1 inches. Grains are angular to rounded.</p>
10	+++++0000V		36		
15	=====		20		
20	+++++0000		38		
25	+++++VVV=		11		
30	+++++VVV=		20		
35	=====++		18		
40	=====++		8		
45	=====++V		14		
50	=====++V		22		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
50			22	Cuttings (cont'd)	
55			18		
60			16		
65			7		
70			6		
75			5		
80			15		
85			12		
90			6		
95			8		
100			12		
105			16		
110			11		
115			67		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
115			67	Cuttings (cont'd)	
120			21		
125			66		
130			7		
135			7		
140			202		
145			23		
150			93		
155			14		
160			5		
165			7		
170			10		
175			9		
180			7		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
180			7	Cuttings (cont'd)	
185			6		
190			9		
195			9		
200			10		
205			12		
210			10		
215			8		
220			5		
225			6		
230			5		
235			7		
240			13		
245			11		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
245			11	Cuttings (cont'd)	
250			13		
255			12		
260			16		
265			7		
270			8		
275			17		
280			14		
285			16		
290			29		
295			9		
300			18		
305			27		
310			22		



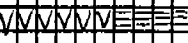

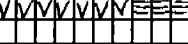
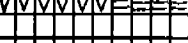
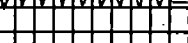


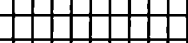



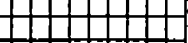
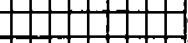
Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
310			22	Cuttings (cont'd)	310'-320' Cuttings range from <.10" to .5" in diameter and are subrounded to angular.
315			27		315'-350' Clays are multi-colored. Stained by iron oxides to reddish and yellow-gold. Some grays and white.,
320			16		
325			29		
330			23		
335			14		
340			15		
345			15		
350			17		
355			29		
360			27		
365			42		
370			23		
375			33		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
375			33	Cuttings (cont'd)	
380			34		380'-405' 50% of sample washes through screen.
385			19		385'-390' Sample not washed to show % of fines present. Sample is predominantly fine grained, .05" diameter or less.
390			8		
395			6		
400			18		
405			8		
410			7		
415			8		
420			9		
425			8		
430			7		
435			10		435'-440' 50% of sample is silt-sized. Sample not washed.
440			7		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
440			7	Cuttings (cont'd)	445'-460' Grains average .10" in washed sample.
445			5		
450			6		
455			6		
460			8		465'-480' Grains are well rounded to rounded.
465			8		
470			7		
475			6		
480			5		503' Last air foam sample.
485			4		
490			5		
495			5		
500			5		
505			12		



Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
505			503'-TD Mud rotary	Cuttings (cont'd)	503'-510' Sampled (shown here as 505'-510'). Note increase in clay %. Mud gel does not wash out formation muds as air foam does.
510			9		510'-645' <u>Volcanic-Rich Alluvium</u> : Unit is comprised of a wide variety of volcanics including green to purple, white, red and gold andesites, rhyolites, and gray to red tuffs and granites eroded and transported from surrounding volcanic highs. Clays represent highly altered zones in the volcanic rich alluvium.
515			9		
520			12		
525			16		503'-525' Andesites increasing over rhyolites in volcanic %.
530			12		525'-530' Cuttings are slightly finer ( $\approx .10''$ ) and angular; may indicate increasing hardness.
535			7		
540			5		
545			4		
550			13		
555			7		
560			8		
565			9		
570			9		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
570			9	Cuttings (cont'd)	
575			8		
580			7		
585			9		
590			7		590'-615' Grains are sub- to well-rounded and range from 0.10"-.25" in diameter. Andesite is the primary constituent, but rhyolites and tuffs are present as well. Possibly 5% calcite cementation of alluvial grains.
595			7		
600			8		
605			10		
610			21		
615			14		
620			19		620'-625' Cuttings are smaller and range from .05" to .25". Clay is buff tan colored but is becoming pinkish. Pink coloration probably due to presence of red tuff.
625			23		625'-630' Brick-red rhyolite more predominant. White calcite makes up 5% of sample.
630			25		630'-635' Clay is brick-red to pinkish tan.
635			17		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
635	VVVVVVEEEE		17	Cuttings (cont'd)	
640	VVVVVVEEEE		26		640'-645' Brick red tuff makes up 75% of the sample. Calcite is increasing in abundance (20%).
645	VVVVVVVVVE		26		645' <u>Bedrock (Tuff)</u> : Unit is a crystal lithic ashflow tuff. Groundmass is dense, blackish-red, and appears welded. Hornblende? phenocrysts show intense reaction rims or are altered to hematite completely. Large subhedral quartz phenocrysts, hematite?, biotite and ? feldspars are also present. Phenocrysts comprise up to 50% of the rock. Calcite is present as fracture fillings.
650	VVVVVVVVEE		28		
655	VVVVVVVVEE		20		
660	VVVVVVVVEE		27		
665	VVVVVVVVVE		28		
670	VVVVVVVVVV		30		
675	VVVVVVVVVV		23		
680	VVVVVVVVVV		40		
685	VVVVVVVVVV		47		
690	VVVVVVVVVV		34		
695	VVVVVVVVVV		34		
700	VVVVVVVVVV		17 to 698'		TD = 698'